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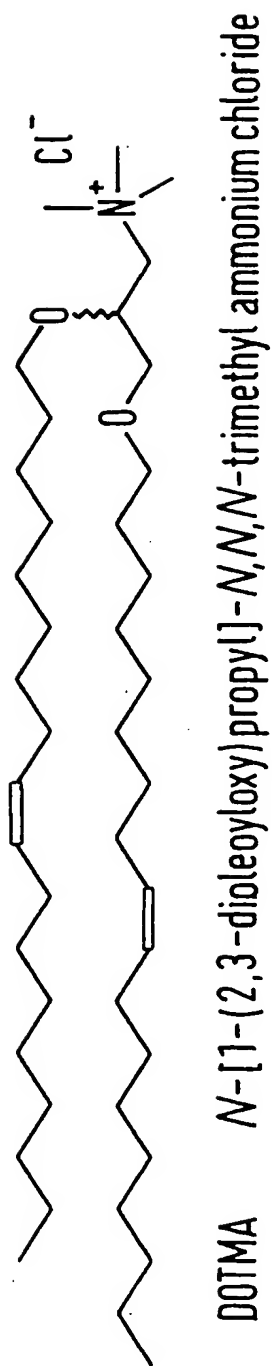


FIG. 1

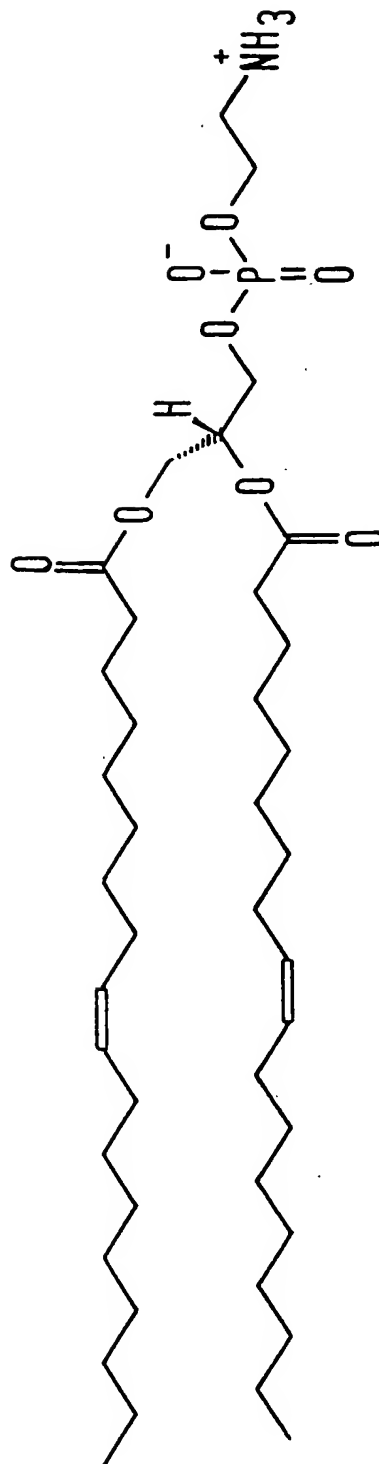


FIG. 2

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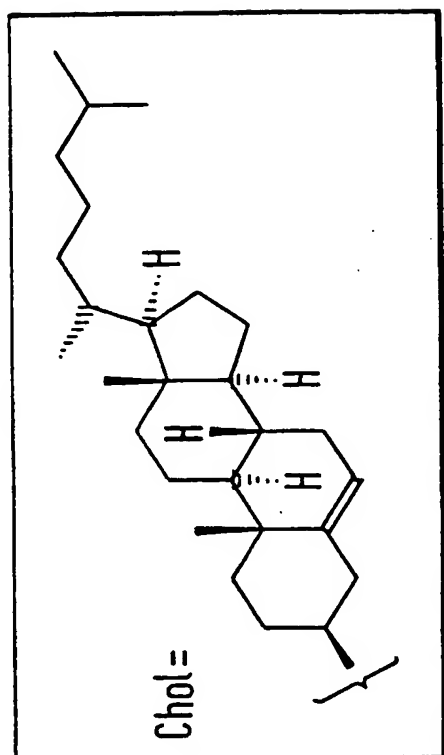
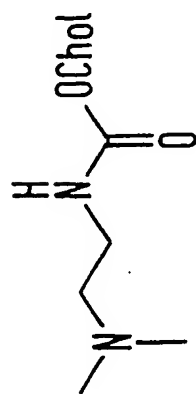
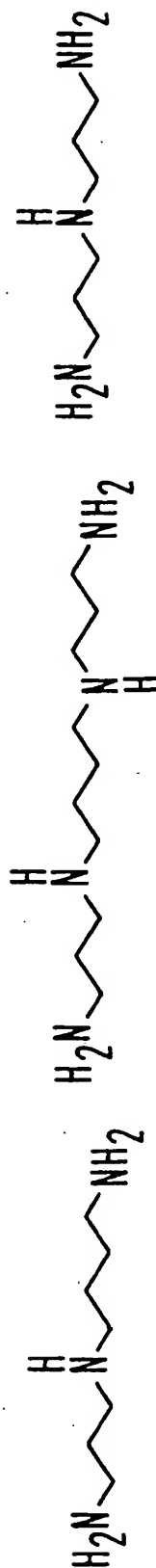


FIG. 3



3β-[(N,N-dimethylaminoethyl)carbamoyl]cholesterol

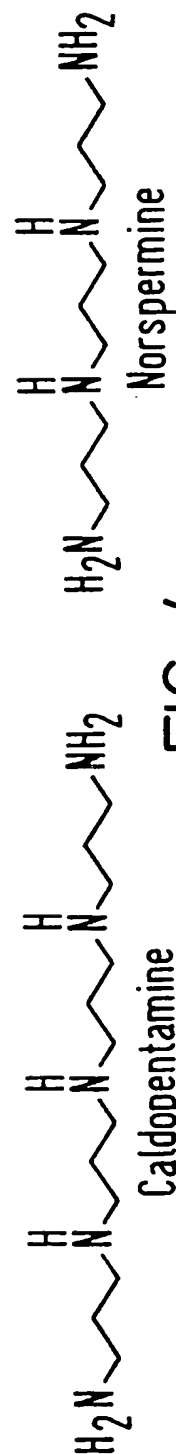
DC-Chol



Spermidine

Spermine

Norspermidine



Caldopentamine

Norspermine

FIG. 4

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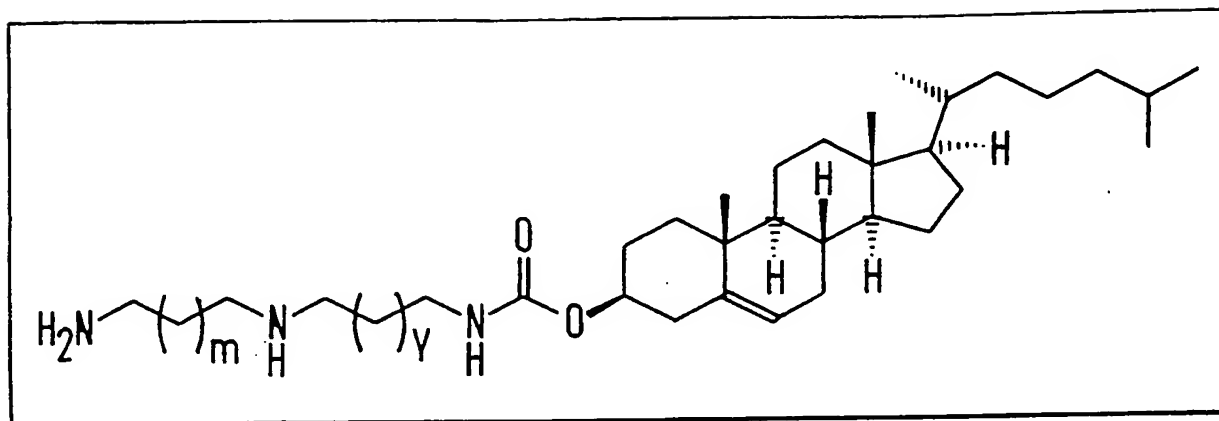
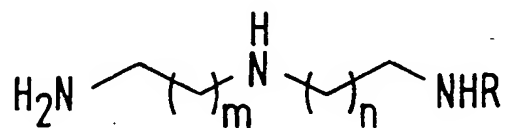


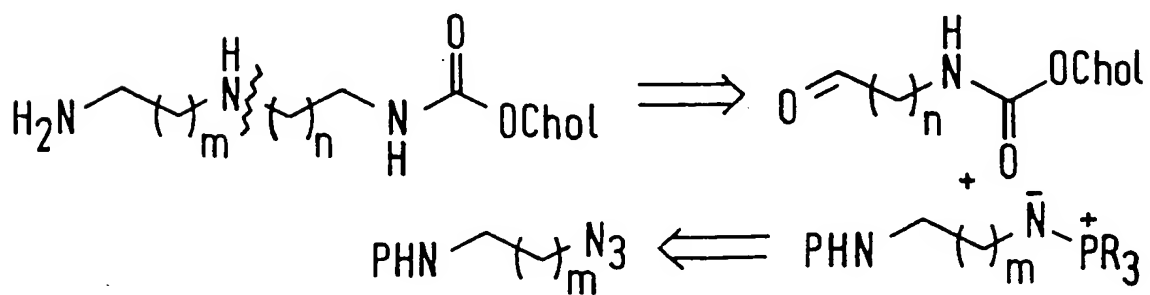
FIG. 5



2, R = C(O)Ochol

3, R = H

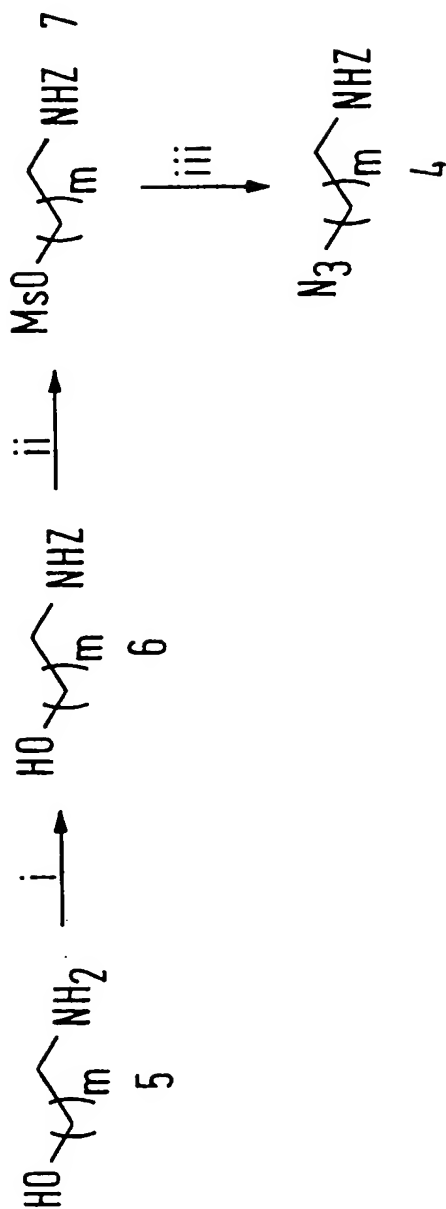
FIG. 6



Scheme 1

FIG. 7

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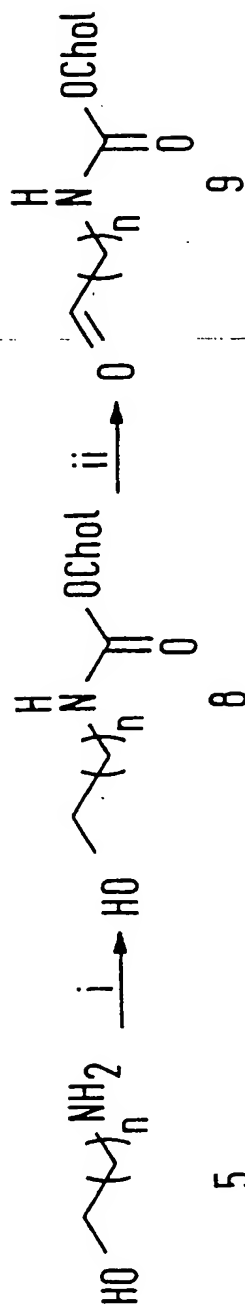
Scheme 2 Reagents and conditions: i, CH₂Cl₂ (0.2M), PhCH₂OC(O)Cl (0.45 eqv), 10h; ii, CH₂Cl₂ (0.2M), Et₃N (3 eqv), CH₃SO₂Cl (2.5 eqv) 0°C to r.t., 15min; iii, DMF (0.15M), NaN₃ (5 eqv), NaI, 80°C, 2h

	6a	6b	6c	7a	7b	7c	4a	4b	4c
m	1	2	3	1	2	3	1	2	3
YIELD / %	89	86	92	97	88	95	98	90	96

FIG. 8

Table 1

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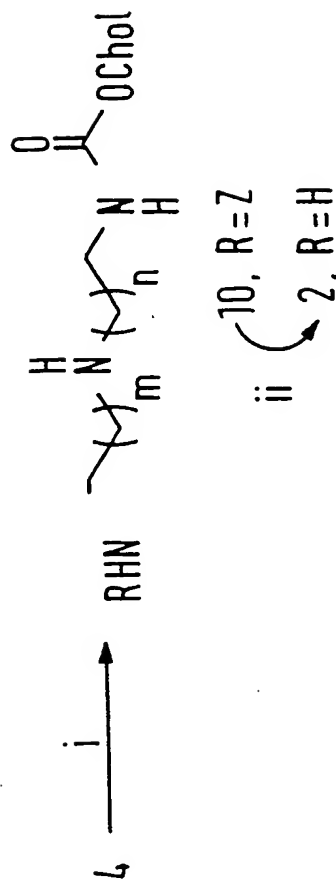


Scheme 3 Reagents and conditions: i, CH_2Cl_2 (0.2M), CholOC(O)Cl (0.45 eqv), 5h; ii, a, CH_2Cl_2 (0.1M) $(\text{COCl})_2$ (1.5 eqv), DMSO (3 eqv), -78°C , 15min; b, 8, 15 min; c, $i\text{-Pr}_2\text{NEt}$ (3 eqv) to r.t.

	8a	8b	9a	9b
n	1	2	1	2
YIELD / %	98	99	97	93

FIG. 9

Table 2



Scheme 4 Reagents and conditions: i, a, THF (0.5M), 4 Å molecular sieves, PMe₃ (1.15 eqv), 30 min; b, 9 (1.1 eqv), 3h; c, EtOH (0.5M), NaBH₄ (2 eqv), 20 h; ii, EtOH (0.2M), c-C₆H₁₀ (20 eqv), 10% Pd(C) (0.5 eqv), reflux, 30 min

	10a	10b	10c	10d	10e	10f	2a	2b	2c	2d	2e	2f
m	1	2	3	1	2	3	1	2	3	1	2	3
n	1	1	1	2	2	2	1	1	1	2	2	2
YIELD / %	79	72	89	83	87	90	99	99	99	99	99	99

FIG. 10

Table 3

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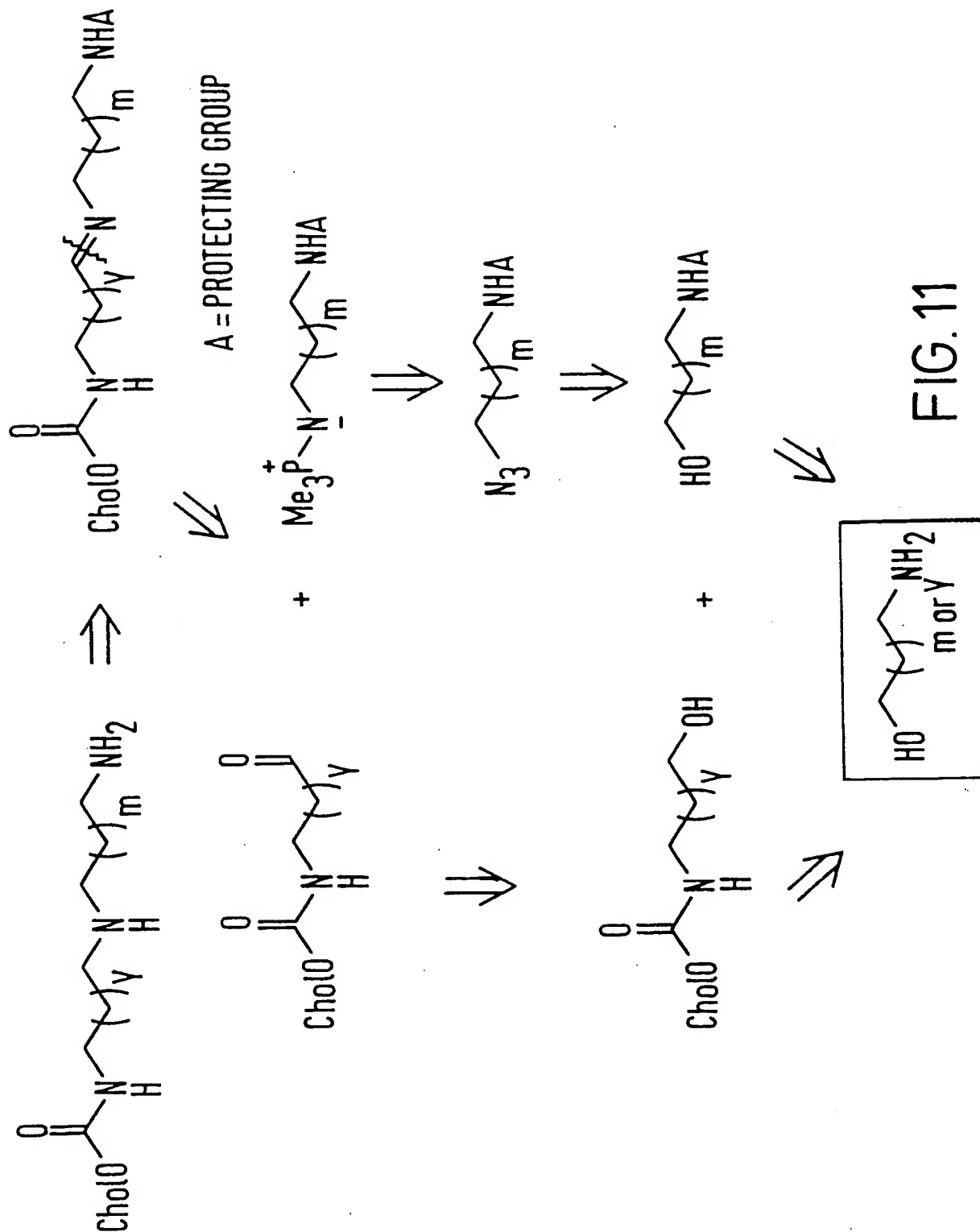
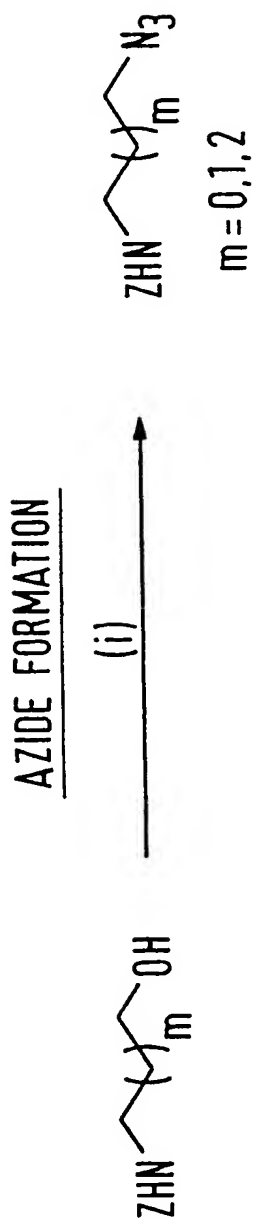


FIG. 11

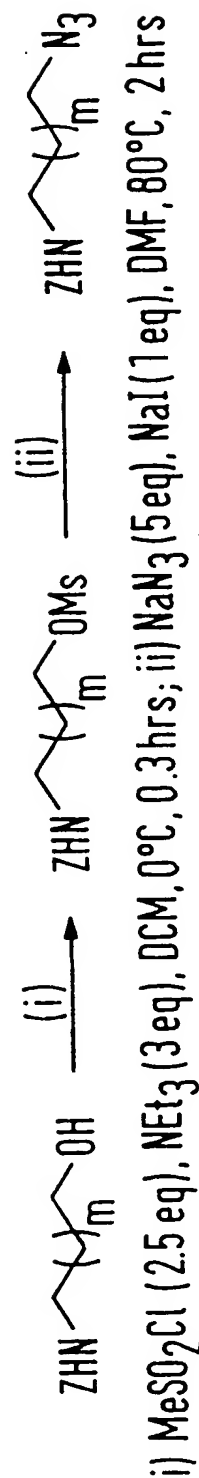
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i) PPh_3 (2 eq), DIPAD (2 eq), $\text{ZnN}_6 \cdot 2 \text{ Py}$ (0.75 eq), toluene, 2 hrs

m	yield (%)
0	87
1	92
2	90

FIG. 12



m	Overall yield (%)
0	95
1	79
2	91

FIG. 13

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Y	yield (%)
0	97
1	93

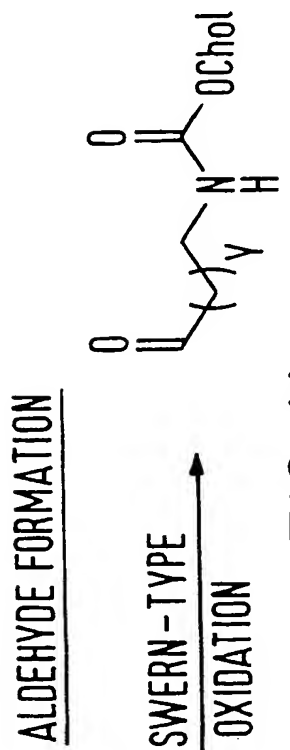
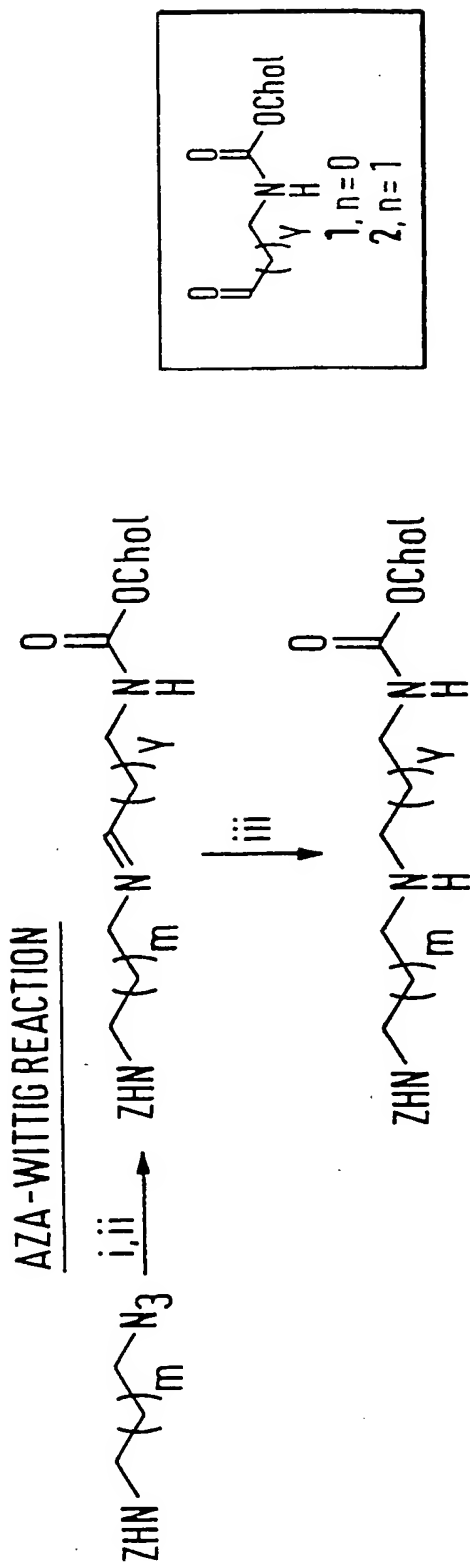


FIG. 14

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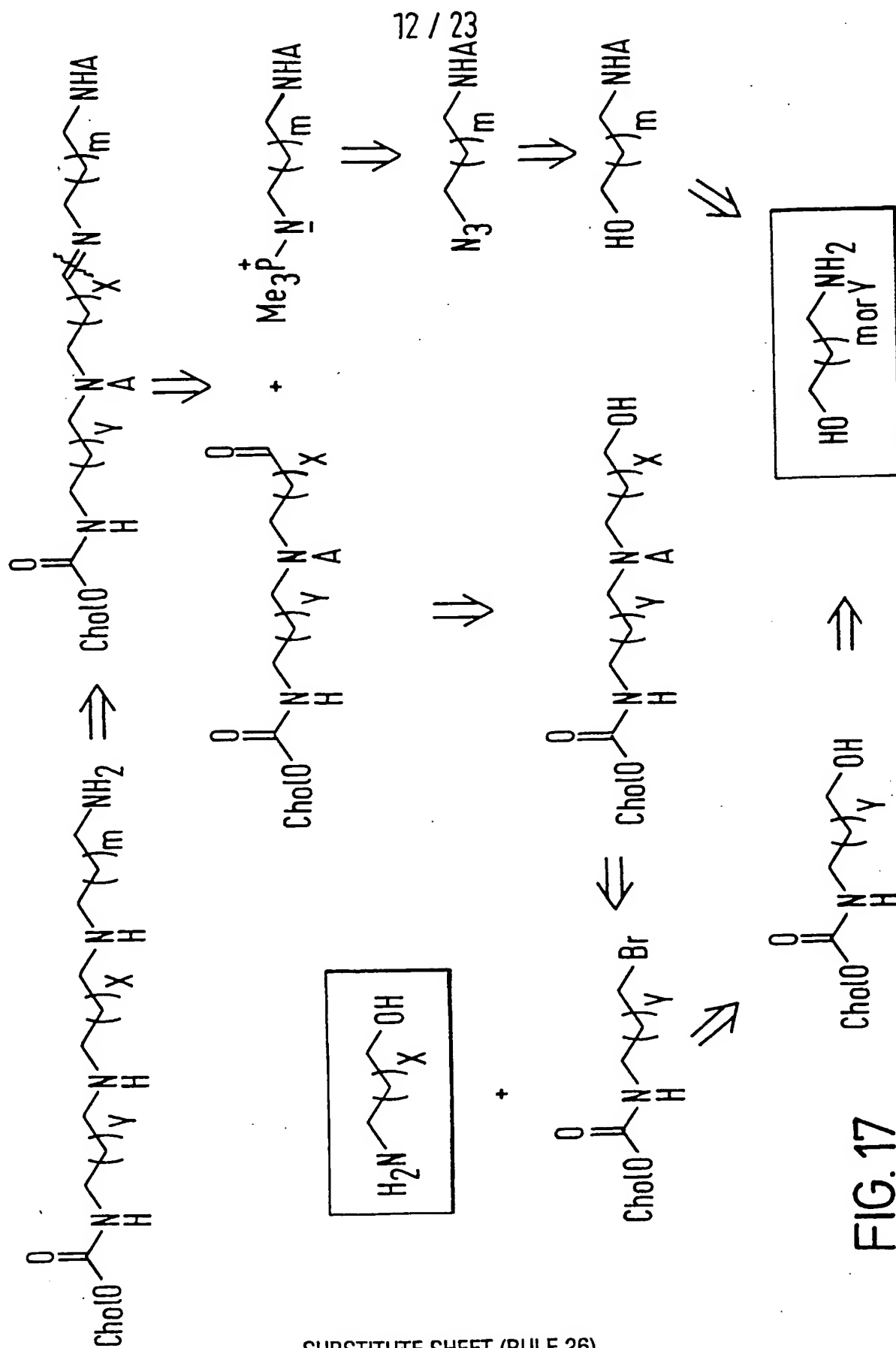


i) PMe_3 (1.1 eq), 4\AA MS (1 g / mmol), THF, 0.75 hrs; ii) **1** or **2** (1.2 eq) in THF, 5-18 hrs;
 iii) NaBH_4 / diglyme (2.0 eq), EtOH, 24 hrs

m	Y	Yield (%)
0	0	79
1	0	72
2	0	89
0	1	83
1	1	87
2	1	90



FIG. 15



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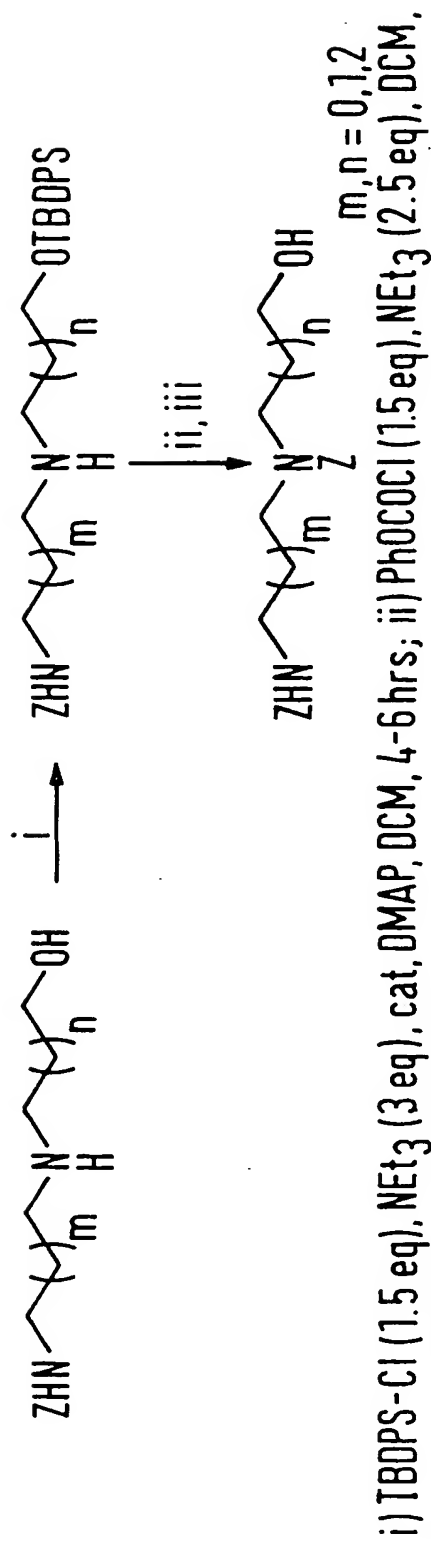
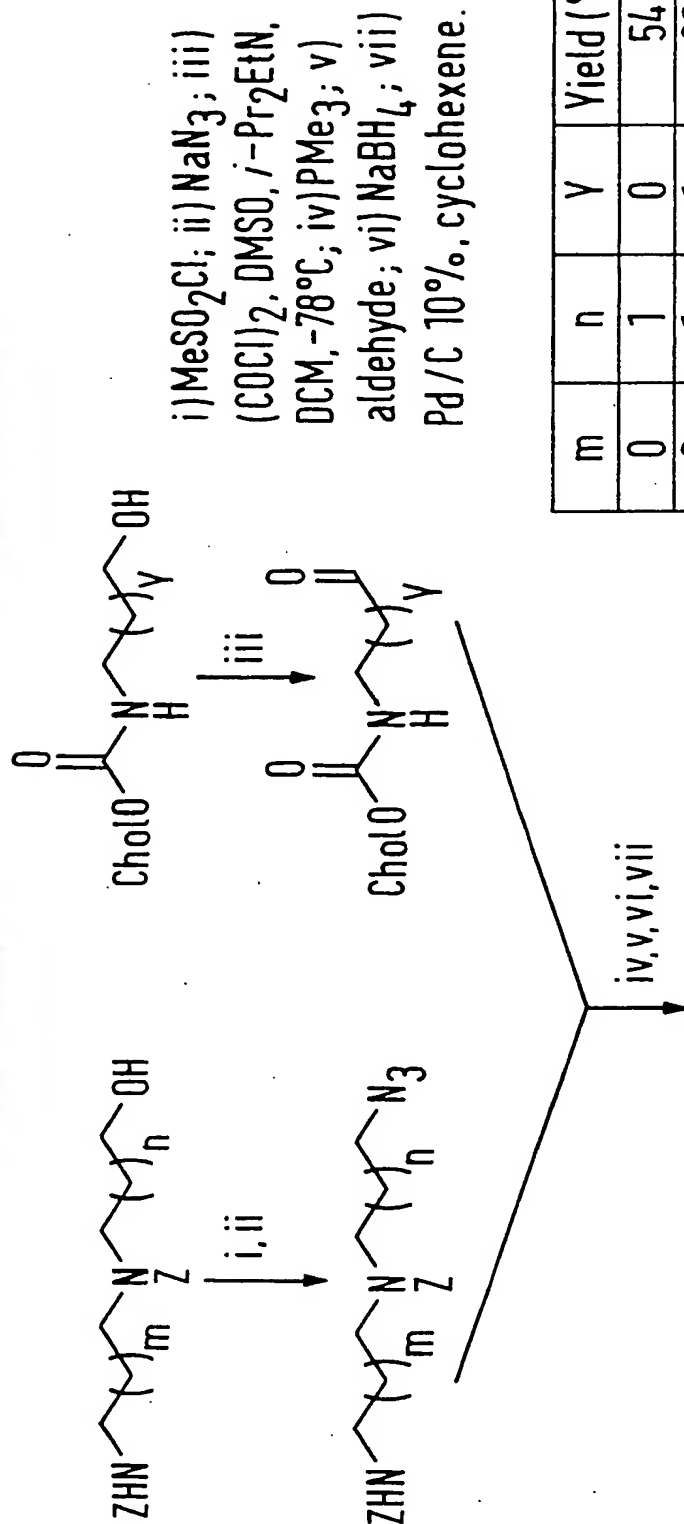


FIG. 19

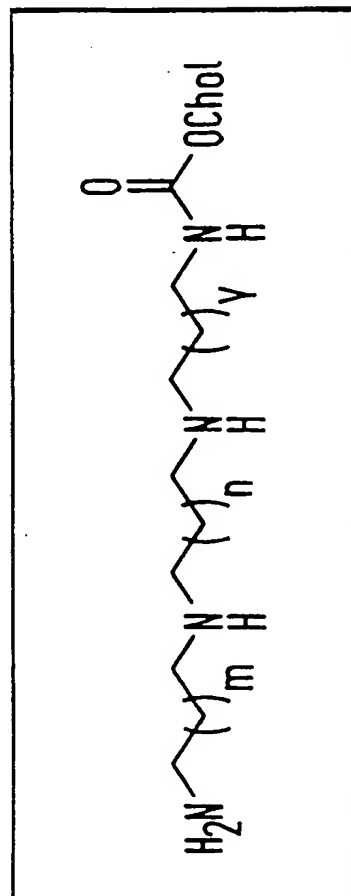
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APPLICATION TO SYNTHESIS OF SPERMINOLIPIDS



m	n	Y	Yield (%)
0	1	0	54
0	1	1	69
0	2	1	80
1	2	1	71
1	0	0	64

FIG. 20



APPLICATION TO SYNTHESIS OF PENTAMINOLIPIDS

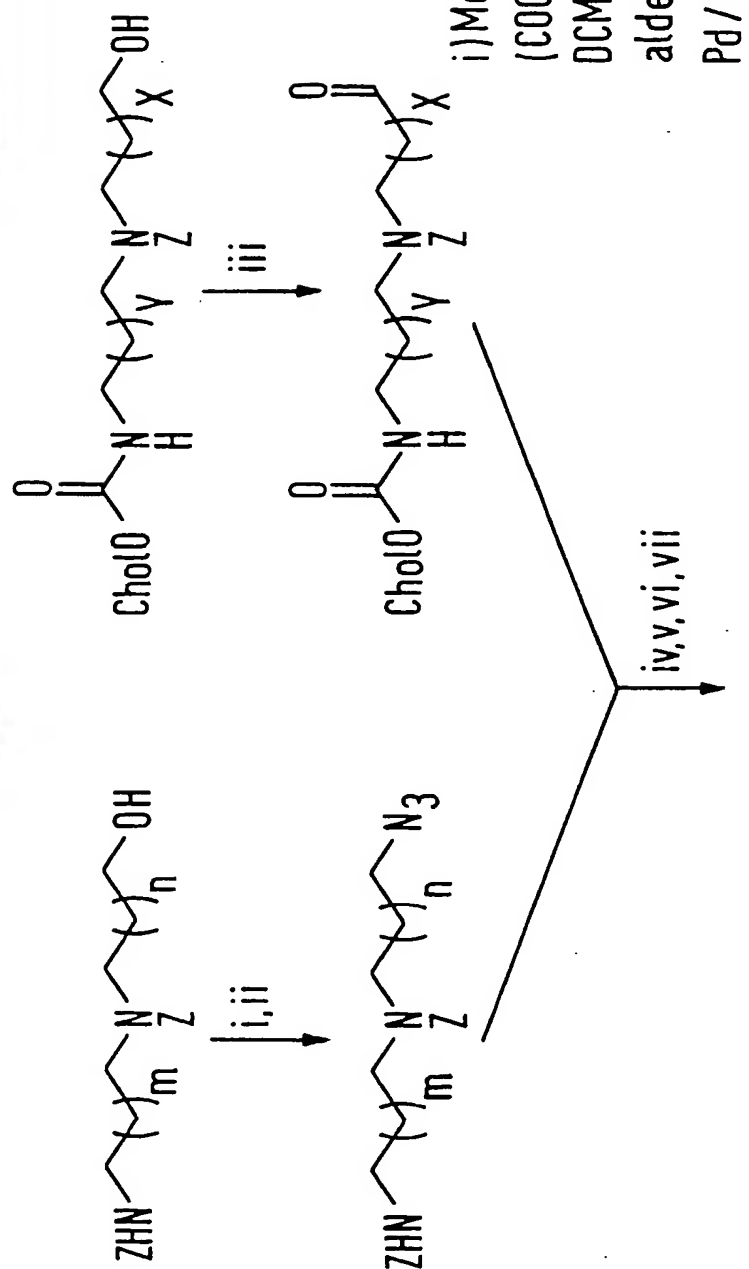
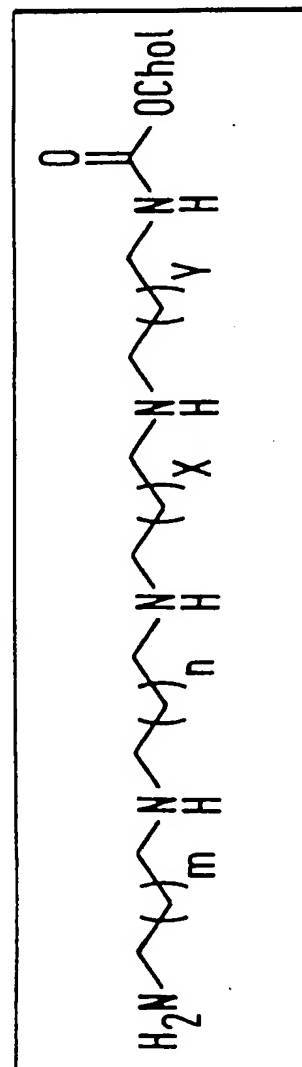


FIG. 21

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i) MeSO_2Cl ; ii) NaN_3 ; iii) $(\text{COCl})_2$, DMSO, $i\text{-Pr}_2\text{EtN}$, DCM, -78°C ; iv) PMe_3 ; v) aldehyde; vi) NaBH_4 ; vii) Pd/C 10%, cyclohexene.

m	n	X	Y	Yield (%)
1	2	2	1	56
0	1	2	1	74



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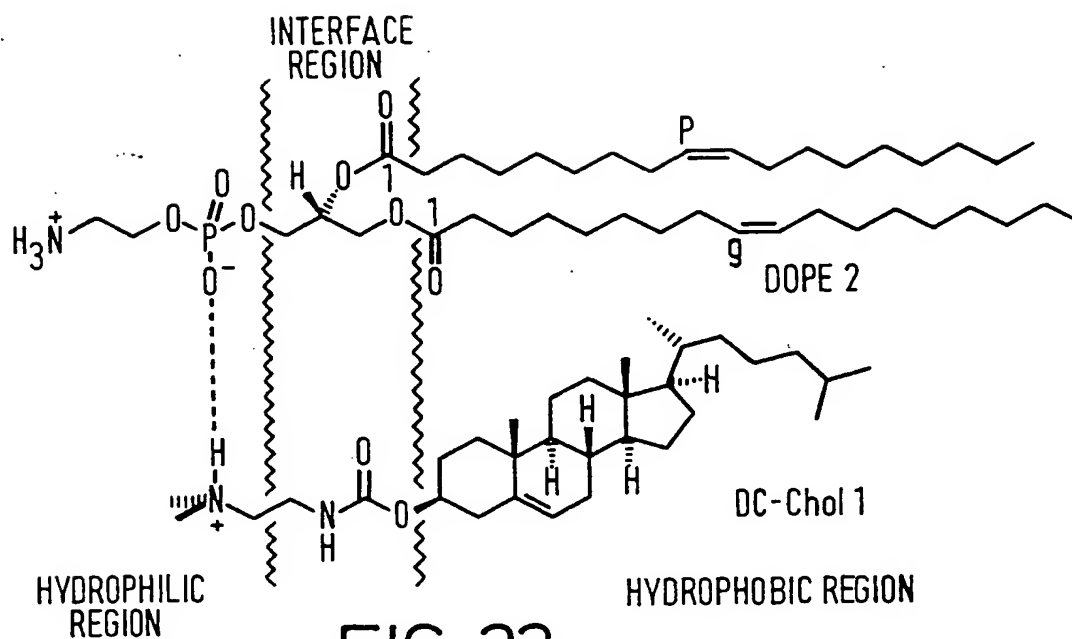


FIG. 22

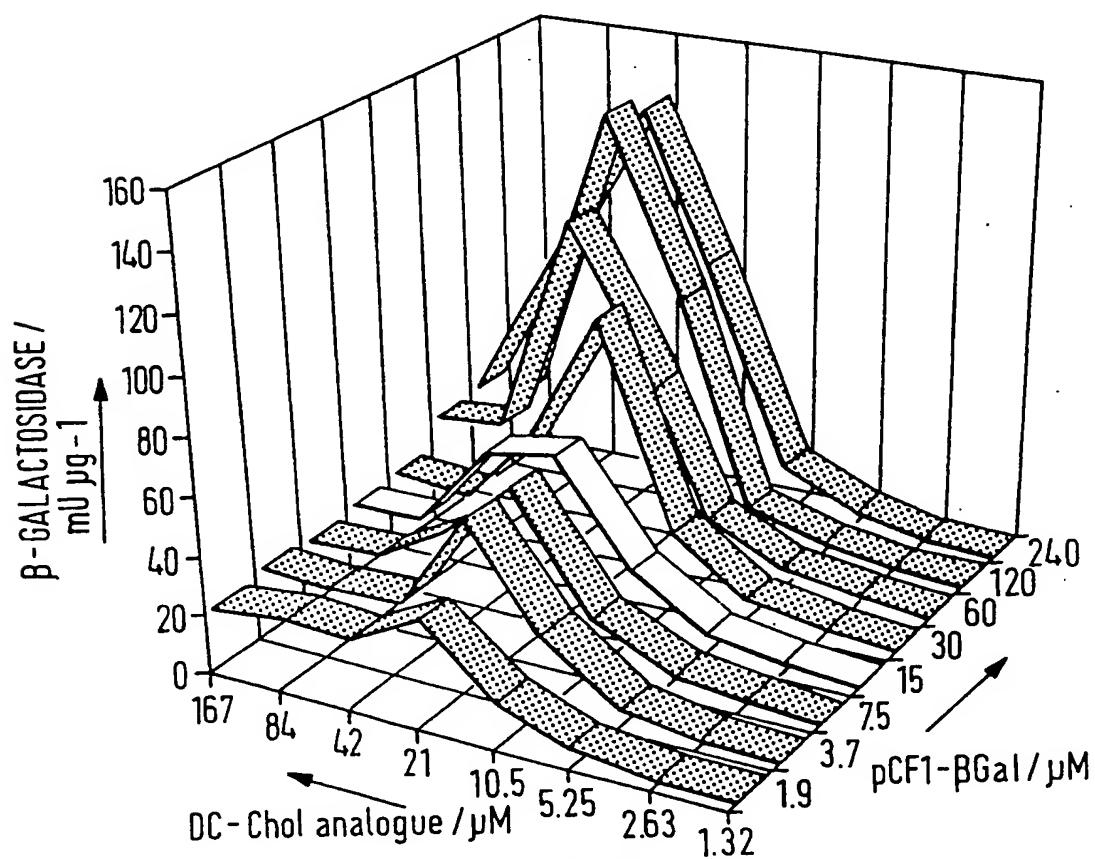


FIG. 23

SUBSTITUTE SHEET (RULE 26)

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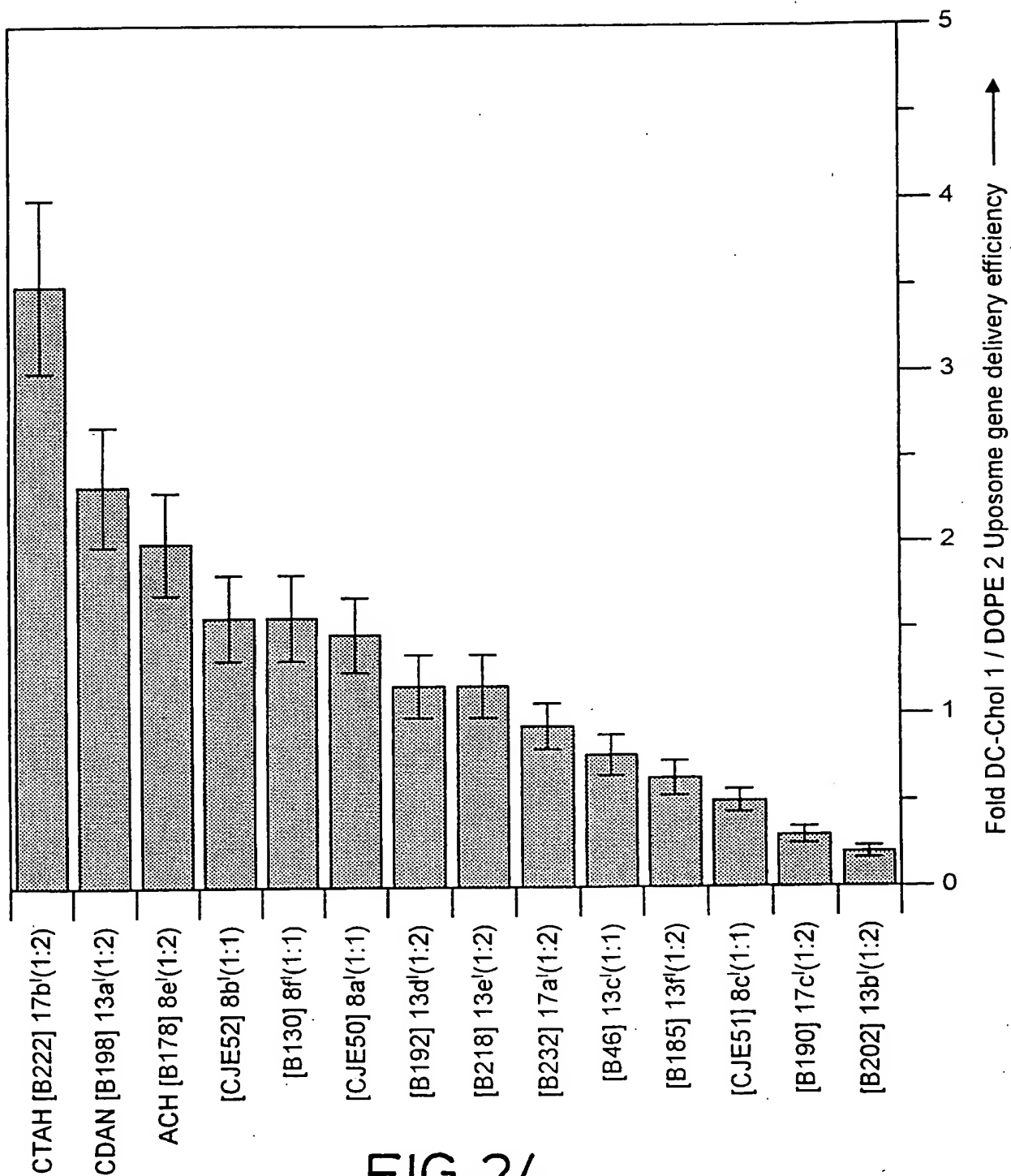


FIG. 24

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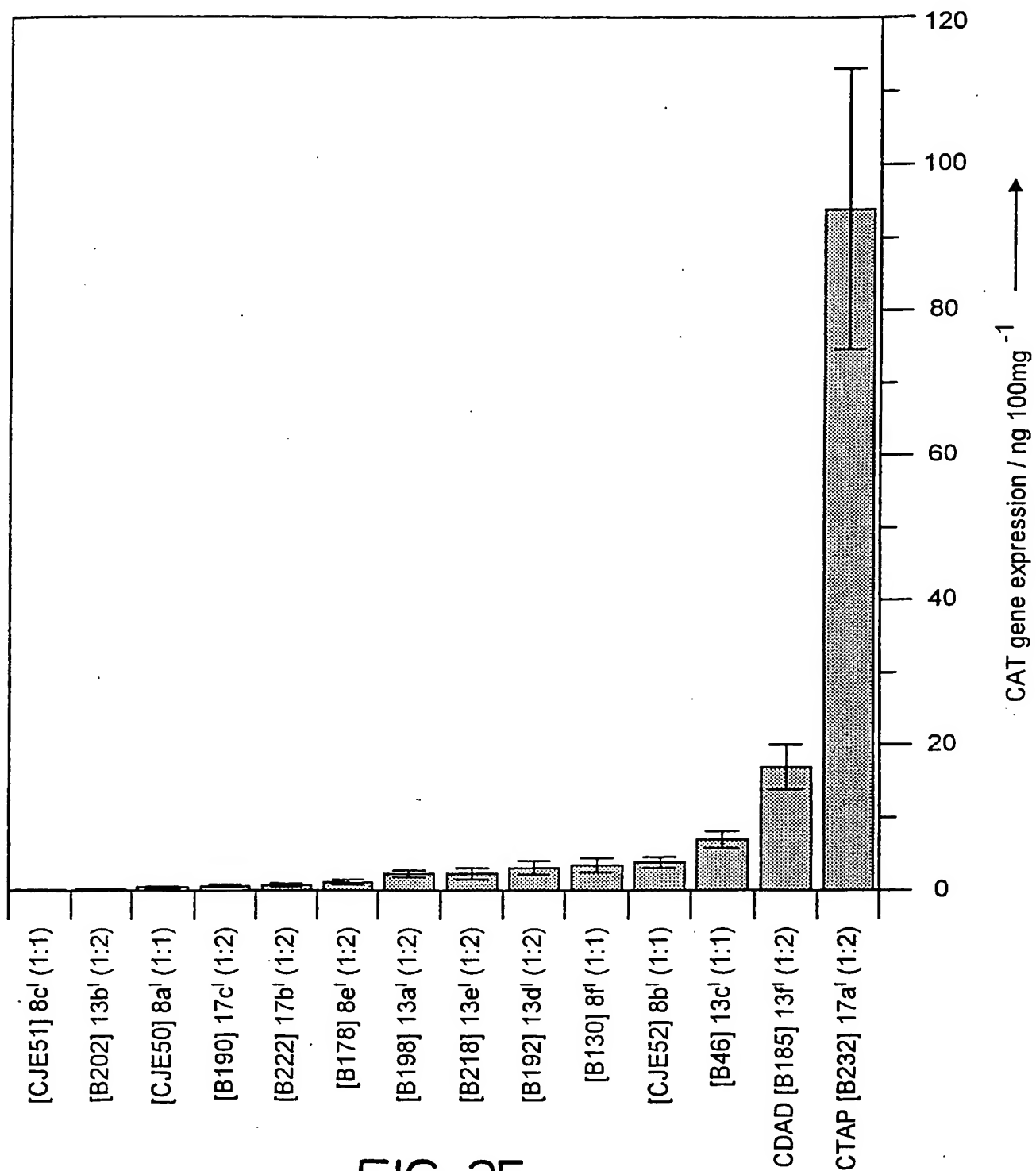


FIG. 25

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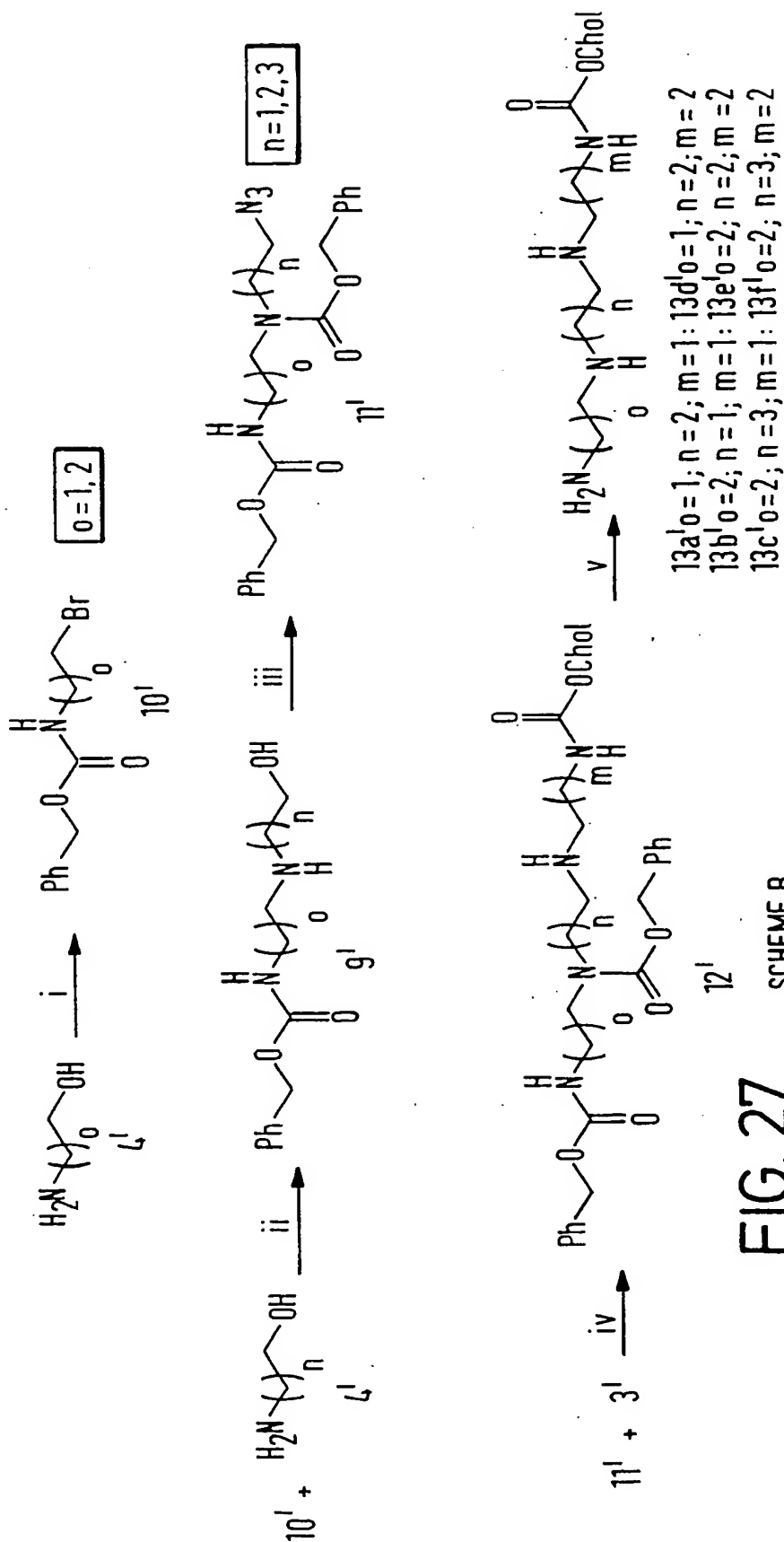


FIG. 27

SCHEME B

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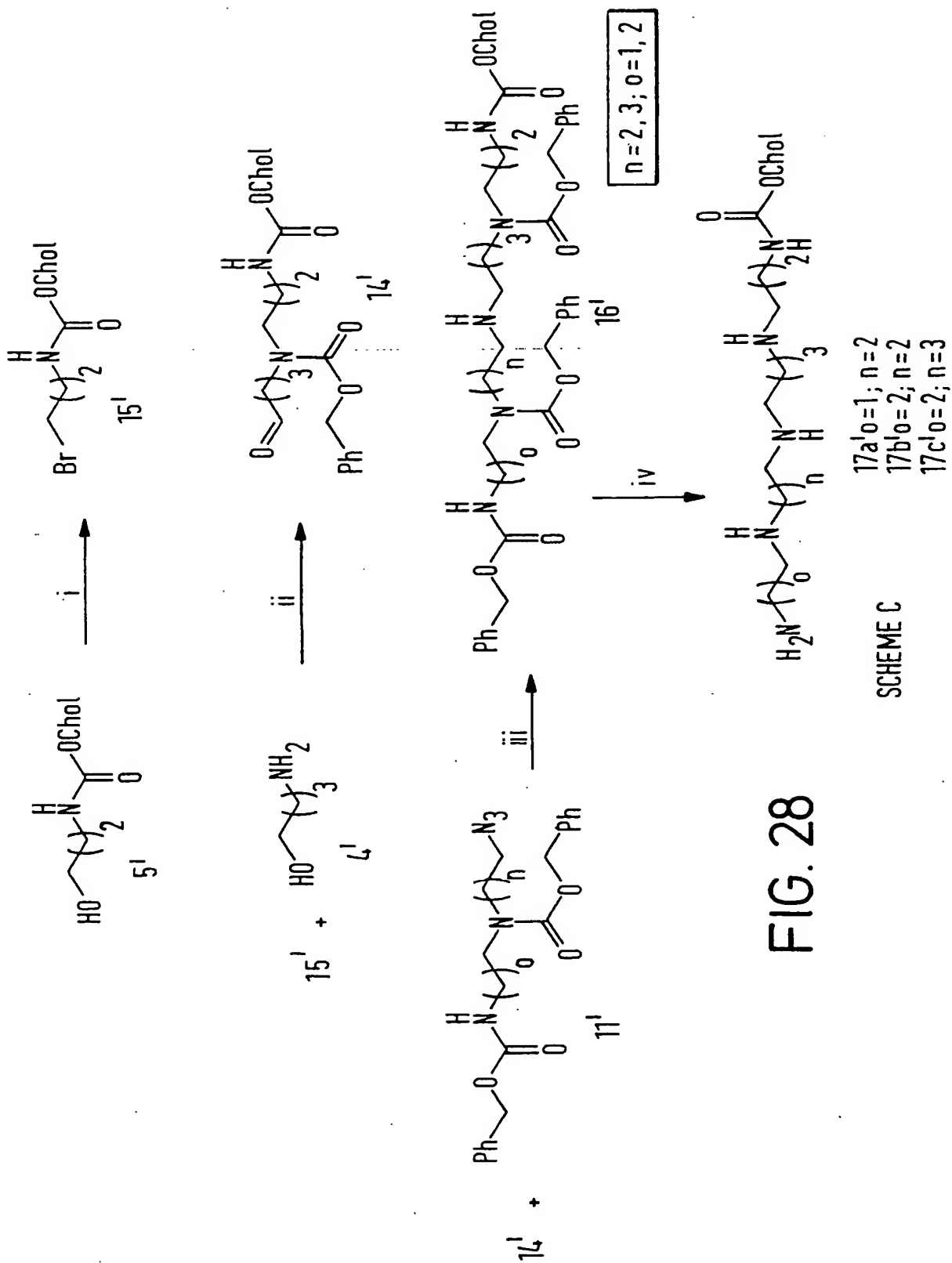


FIG. 28

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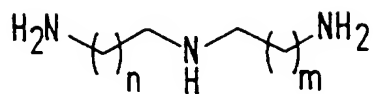
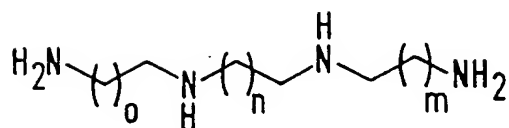
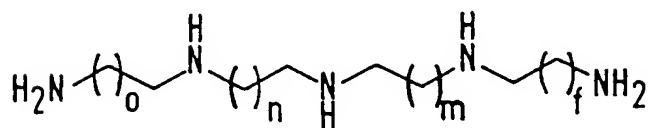
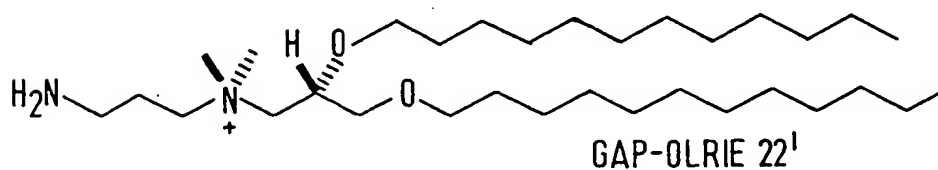
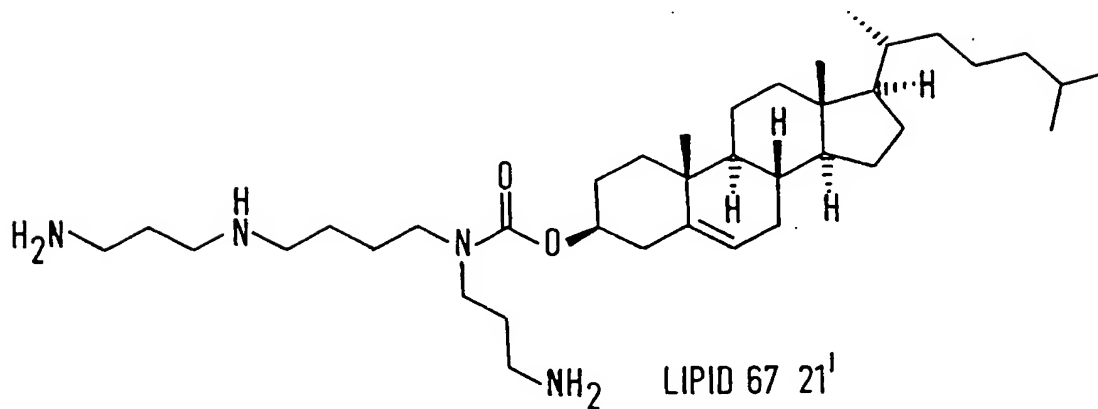
18¹ n = 3; m = 219¹ o = 2; n = 3; m = 220¹ f, m, n, o = 2

FIG. 29

SUBSTITUTE SHEET (RULE 26)